Software Assurance Education

Description

Presents a series of articles on software assurance education. Software assurance education is an essential activity for increasing the number of skilled software assurance professionals. Topics include development of a Master of Software Assurance Reference Curriculum, development of a National Software Assurance Repository, security requirements engineering education, and ways of integrating software assurance into standard computing curricula.

Overview Article

Name	Version Creation Time	Abstract
Software Assurance Education Overview	9/30/11 9:45:20 AM	Complex software systems affect nearly every aspect of our lives, in areas such as defense, government, energy, communication, transportation, manufacturing, and finance. Protecting these systems against vulnerabilities and attacks is critical, so there is a growing demand for skilled professionals who can build security and correct functionality into software and systems under development. Yet there are few software assurance programs or tracks that focus on developing assured software and, consequently, not enough professionals to meet the growing demand.

Most Recently Updated Articles [Ordered by Last Modified Date]

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Development of a Master of Software Assurance Reference Curriculum	9/29/11 3:18:30 PM	Modern society is deeply and irreversibly dependent on software systems of remarkable scope and complexity in areas that are essential for preserving our way of life. The security and correct functioning of these systems are vital. Recognizing these realities, the U. S. Department of Homeland Security (DHS) National Cyber Security Division (NCSD) enlisted the resources of the Software Engineering Institute at Carnegie Mellon University to develop a curriculum for a Master of Software Assurance degree program and define transition strategies for implementation. In this article, we present an overview of the Master of Software Assurance curriculum project, including its history, student prerequisites and outcomes, a core body of knowledge, and a curriculum architecture from which to create such a degree program. We also provide suggestions for implementing a Master of Software Assurance program.
The Development of a Graduate Curriculum for Software Assurance	8/24/11 9:53:06 AM	One of our challenges as educators is timely incorporation of research into curricula that can be adopted by universities to ultimately improve software engineering practice. In this paper, we describe the work of the Master of Software Assurance curriculum project. This includes our sources, process, products, adoption strategies, and early adoption experiences. The project used research results, prior curricula, and documented bodies of knowledge to develop a new curriculum. We are now working with early adopters and employing a number of transition mechanisms

		as part of our strategy to further adoption in this critical area.
Getting Secure Software Assurance Knowledge into Conventional Practice	8/1/11 10:04:25 AM	This paper describes three educational initiatives in support of software assurance education. The first project attempted to identify and document any knowledge, from any source, that could be related to the assurance of software. The second initiative focuses on the development of a master of software assurance reference curriculum. The third initiative implements the reference curriculum as two tracks within a Master of Science in Software Engineering program.
Teaching Security Requirements Engineering Using SQUARE	2/28/11 2:56:18 PM	This paper details the validation of a comprehensive teaching model for security requirements engineering which ensures that security is built into the software from its inception. It centers on the employment of the SQUARE method for secure software requirements engineering, which was developed at Carnegie Mellon University. The effectiveness of the SQUARE method, its learning system and the initial results of using it in student case studies and in a practical, higher education classroom application are reported.

All Articles [Ordered by Title]

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Defining the Discipline of Secure Software Assurance: Initial Findings from the National Software Assurance Repository	2/25/11 10:15:05 AM	Defect free software is a critical national priority. Yet, we still do not fully understand the shape of the field that underlies the process of producing, sustaining and acquiring secure software. Specifically, there is no common agreement on the knowledge requirements for the field, nor is there even full agreement about the activities that legitimately comprise the process itself. Recognizing this, the Department of Defense, through the National Security Agency, has begun a

		three-year study to characterize the form and contents of the discipline of software assurance. This type of rigorous study is a necessary first step in formulating an academic study of the field. It is also a prerequisite to formulating the practical steps necessary to achieve a secure software base. The first phase of the project, which has just been completed, created a database containing the known empirical, theoretical, critical/analytic and methodological knowledge elements of the field. This report utilizes that database to characterize the current state of secure software assurance work and suggest future directions.
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Integrating Software Assurance Knowledge into Conventional Curricula	2/28/11 2:55:35 PM	One of our challenges is deciding how best to address software assurance in our university curricula. One approach is to incorporate software assurance knowledge areas into conventional computing curricula. In this article we discuss the results of a comparison of the Common Body of Knowledge for Secure Software Assurance with traditional computing disciplines. The comparison indicates that software engineering is probably the best fit for such knowledge areas, although there is overlap with other computing curricula as well.
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Two Nationally Sponsored Initiatives for Disseminating Assurance Knowledge	2/28/11 9:17:50 AM	Education in software assurance is an essential element in the effort to produce secure code. This paper describes two efforts that support national cybersecurity education goals: development of software assurance learning artifacts that can be integrated into conventional learning environments and development of a master of software assurance reference curriculum.